Beech Bark Disease Monitoring and Impact Analysis

Findings and Status:

During 2005 beech bark disease continued to spread throughout Michigan's northern hardwood forests. Fifty-four percent of the plots in the BBD monitoring system had beech scale present in 2005, compared to 36% in 2004 and 30% in 2001. The 89 plots that were established during 2002 were remeasured during the 2005 field season; 50 plots were in the LP and 39 plots were located in the UP. In 2002 10 of the 50 plots in the LP had beech scale, and this increased to 24 plots with beech scale in 2005, an increase of over 50%. In the UP the number of plots with beech scale increased from 20 in 2002 to 24 in 2005.

There was a more significant spread of beech scale in the LP compared to the UP since most of the plots in the UP already had beech scale in 2002. Beech scale is still much more widespread in the UP compared to the LP. Beech scale is now present in 7 counties in the LP (Emmet, Grand Traverse, Leelanau, Oceana, Mason, Manistee, Wexford) and present in 5 counties in the UP (Alger, Chippewa, Luce, Mackinac, Schoolcraft). Possible new scale infestations were found on Bois Blanc Island, Drummond Island, Antrim County, Cheboygan County, Otsego County, and in the western part of Alger County, although these scale populations were in such low numbers that I did not count them in the overall analysis. We will continue to monitor these areas to determine if the beech scale establishes substantial populations in these areas.

The increased presence of BBD and other disturbances over the study period may impact forest health and productivity at both the stand and the tree-level. Dead BA of beech and all species increased between 2002 and 2005 in both the LP and UP. Percent of dead beech BA also increased in both the LP and UP over the study period. Percent beech BA dead increased significantly between 2002-2005 in stands with beech scale present, and percent beech BA dead was higher in plots with scale compared to plots without scale.

The proportion of dead beech increased between 2002 and 2005 in all plots showing an overall increase in beech mortality, and plots with beech scale also had a higher proportion of dead beech compared to plots without beech scale. Foliage transparency increased significantly between 2002 and 2005 for beech trees in plots with and without beech scale. Percent dieback increased significantly in plots with and without beech scale between 2002 and 2005 and plots with beech scale had higher dieback ratings compared to plots without beech scale.

Many of the same trends that were seen between 2001 and 2004 existed between 2002 and 2005. Each year BBD spreads to new areas and intensifies in areas where beech scale is already present. In some stands in the LP, beech scale is actually declining in some areas since much of the beech resource in some stands is dead.

Despite the discontinuity of beech stands in the LP due to agriculture and urban areas, BBD is continuing to spread throughout much of the LP and spread into several new areas between 2002 and 2005 including areas in Emmet, Leelanau and Manistee Counties, and possible areas in Antrim, Cheboygan, and Otsego Counties. In the UP beech scale continues to spread throughout much of the eastern UP and possible infestations in the western part of Alger County will be closely monitored in the next few field seasons. Beech mortality has increased severely in Tahquamenon State Park, and a lot of thinning of hazardous dying and dead trees has taken place in the Park over the last year. Preliminary results demonstrate the spread of beech bark disease in both the Lower and Upper Peninsulas of Michigan between 2002 and 2005. Beech mortality from BBD and other factors increased between 2002-2005, as well as crown measurements such as transparency and dieback. These trends are expected to increase as BBD continues to spread throughout Michigan and intensifies within stands where it is already present.